

Amendments to the Claims

Please amend the claims as follows:

1. (Original) An apparatus comprising:

a first signal monitor for measuring:

(i) the signal strength at said first signal monitor of a first packet transmitted by an emitter; and

(ii) the signal strength at said first signal monitor of a second packet transmitted by a wireless terminal; and

a processor for:

(a) receiving the location of said emitter; and

(b) determining the location of said wireless terminal based on (i), (ii), and the location of said emitter.

2. (Original) The apparatus of claim 1 further comprising said emitter for transmitting over a wireless medium said first packet wherein said first packet comprises information related to the location of said emitter.

3. (Original) The apparatus of claim 1 further comprising a second signal monitor for measuring:

(i) the signal strength at said second signal monitor of said first packet transmitted by said emitter; and

(ii) the signal strength at said second signal monitor of said second packet transmitted by said wireless terminal.

4. (Currently Amended) An apparatus comprising: The apparatus of claim-3
a first signal monitor for measuring:

(i) the signal strength at said first signal monitor of a first packet
transmitted by an emitter;

(ii) the signal strength at said first signal monitor of a second packet
transmitted by a wireless terminal;

a second signal monitor for measuring:

(i) the signal strength at said second signal monitor of said first packet
transmitted by said emitter; and

(ii) the signal strength at said second signal monitor of said second packet
transmitted by said wireless terminal; and

a processor for:

(a) receiving the location of said emitter; and

(b) determining the location of said wireless terminal based on (i) the
signal strength at said first signal monitor of the first packet transmitted by the
emitter, (ii) the signal strength at said first signal monitor of the second packet
transmitted by the wireless terminal, and the location of said emitter, wherein

said processor is also for:

acquiring (i) a first plurality of signal strength measurements made by said
first signal monitor and (ii) a second plurality of signal strength measurements
made by said second signal monitor, wherein said first plurality and said second
plurality each are associated with a plurality of signal sources that comprise said
emitter;

interpolating (i) said first plurality across two dimensions to form a first scalar array of signal samples and (ii) said second plurality across two dimensions to form a second scalar array of signal samples; and
generating a vector array of synthetic signal strength vectors based on said first scalar array of signal samples and said second scalar array of signal samples.

5. (Original) The apparatus of claim 4 wherein said processor is also for matching a presented signal strength vector to at least one of said synthetic signal strength vectors.

6. (Original) The apparatus of claim 5 wherein matching said presented signal strength vector comprises finding the closest match in signal vector space.

7. (Original) The apparatus of claim 4 wherein interpolating said first plurality is performed using Akima splines.

8. (Original) The apparatus of claim 4 wherein said processor is also for smoothing said first plurality.

9. (Original) The apparatus of claim 8 wherein smoothing is based on a generalized additive model.

10. (Original) The apparatus of claim 4 wherein said processor is also for assigning a signal value in place of a missing signal strength measurement.

11. (Original) The apparatus of claim 10 wherein said signal value is less than or equal to -92 dBm.

12. (Original) The apparatus of claim 4 wherein the signal strength measurement that represents a signal source is one of (i) the median of and (ii) the mean of more than one signal strength measurement made over time of said signal source.

13. (Original) The apparatus of claim 2 wherein said emitter is stationary.

14. (Original) The apparatus of claim 2 wherein said information related to the location of said emitter indicates the medium access control address of said emitter.

15. (Original) The apparatus of claim 2 wherein said information related to the location of said emitter indicates the coordinates of said emitter.

16. (Original) An apparatus comprising:
an emitter for transmitting a signal and an identifier;
a first signal monitor for making:

(i) a first plurality of signal strength measurements of said signal, wherein said first plurality is associated with a plurality of signal sources that comprise said emitter; and

(ii) a measurement of at least one packet from a wireless terminal; and

a second signal monitor for making a second plurality of signal measurements, wherein said second plurality is associated with a plurality of signal sources that comprise said emitter; wherein said first plurality of signal strength measurements, said second plurality of signal strength measurements, said identifier, and said measurement of said at least one packet are used to determine the location of said wireless terminal.

17. (Currently Amended) An apparatus comprising: ~~The apparatus of claim 16 further comprising~~

an emitter for transmitting a signal and an identifier;

a first signal monitor for making:

(i) a first plurality of signal strength measurements of said signal, wherein said first plurality is associated with a plurality of signal sources that comprise said emitter; and

(ii) a measurement of at least one packet from a wireless terminal;

a second signal monitor for making a second plurality of signal measurements, wherein said second plurality is associated with a plurality of signal sources that comprise said emitter; wherein said first plurality of signal strength measurements, said second plurality of signal strength measurements, said identifier, and said measurement of said at least one packet are used to determine the location of said wireless terminal;

and

a location estimation server for:

smoothing (i) said first plurality to form a first set of smoothed measurements and (ii) said second plurality to form a second set of smoothed measurements;

interpolating (i) said first set of smoothed measurements across two dimensions to form a first scalar array of signal samples and (ii) said second set of smoothed measurements across two dimensions to form a second scalar array of signal samples; and

generating a vector array of synthetic signal strength vectors based on said first scalar array of signal samples and said second scalar array of signal samples.

18. (Original) The apparatus of claim 17 wherein said location estimation server is also for matching a presented signal strength vector to at least one of said synthetic signal strength vectors.

19. (Original) The apparatus of claim 17 wherein smoothing is based on a generalized additive model.

20. (Original) The apparatus of claim 17 wherein interpolating said first plurality is performed using Akima splines.

21. (Original) The apparatus of claim 17 wherein said location estimation server is also for assigning a signal value in place of a missing signal strength measurement.

22. (Original) The apparatus of claim 21 wherein said signal value is less than or equal to -92 dBm.

23. (Currently Amended) An apparatus comprising: The apparatus of claim 16
an emitter for transmitting a signal and an identifier;
a first signal monitor for making:

(i) a first plurality of signal strength measurements of said signal, wherein
said first plurality is associated with a plurality of signal sources that comprise
said emitter; and

(ii) a measurement of at least one packet from a wireless terminal;
a second signal monitor for making a second plurality of signal measurements,
wherein said second plurality is associated with a plurality of signal sources that
comprise said emitter; wherein said first plurality of signal strength measurements, said
second plurality of signal strength measurements, said identifier, and said measurement
of said at least one packet are used to determine the location of said wireless terminal;

wherein the signal strength measurement that represents a signal source is one of (i) the median of and (ii) the mean of more than one signal strength measurement made over time of said signal source.

24. (Original) The apparatus of claim 16 wherein an access point is collocated with said first signal monitor.

25. (Original) The apparatus of claim 16 wherein said emitter is stationary.

26. (Original) The apparatus of claim 16 wherein said identifier indicates the medium access control address of said emitter.

27. (Original) The apparatus of claim 16 wherein said identifier indicates the location of said emitter.

28. (Original) An apparatus comprising: a network interface for acquiring a first plurality of signal strength measurements that are received by a first signal monitor, wherein said first plurality represents a plurality of signal sources; and a processor for:

- (i) smoothing said first plurality to form a first set;
- (ii) interpolating said first set to form a first scalar array of signal samples across two dimensions; and
- (iii) generating a vector array of synthetic signal strength vectors based on said first scalar array of signal samples and a second scalar array of signal samples.

29. (Original) The apparatus of claim 28 further comprising:
a first emitter for transmitting a first signal and a first identifier; said first signal monitor for making:

- (i) said first plurality of signal strength measurements of said first signal, wherein said first plurality is associated with a plurality of signal sources that comprise said first emitter; and
- (ii) a measurement of at least one packet from a wireless terminal; and a second signal monitor for making a second plurality of signal strength

measurements, wherein said second plurality is associated with a plurality of signal sources that comprise said first emitter; wherein said first plurality of signal strength measurements, said second plurality of signal strength measurements, said first identifier, and said measurement of said at least one packet are used to determine the location of said wireless-terminal.

30. (Original) The apparatus of claim 29 further comprising a second emitter for transmitting a second signal and a second identifier, wherein said second signal and said second identifier are used to determine the location of said wireless terminal.